

## REMARKS

By this amendment, Applicant has amended the claims to further define the invention. In particular, claims 1 and 2 have been amended to recite that the apparatus includes an auto-sampler to which a methanol water mixture and a sample comprising nitropolycyclic aromatic hydrocarbons are sent. Claims 1 and 2 have also been amended to recite that the separation column is a silica gel/C8 separation column and that it is downstream of the auto-sampler for receiving the methanol water mixture and the sample from the auto-sampler. Claims 1 and 2 have also been amended to recite that the reduction column is downstream of the separation column and is for receiving the at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene from the separation column. These amendments are supported by, e.g., Figure 1 and the description at page 5, line 17 to page 8, line 16 of the original specification.

The foregoing amendments place the application in condition for allowance for the reasons set forth hereinafter or, at least, in better form for consideration on appeal. Therefore, entry of this amendment under 37 CFR 1.116 is requested.

Claim 1 stands rejected under 35 U.S.C. 102(b) as allegedly being anticipated by the Li et al. article. Claims 3, 4 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. Applicant again traverses these rejections and requests reconsideration thereof, at least insofar as the

rejections are relevant to the amended claims.

The rejected claims relate to an apparatus for analyzing nitropolycyclic aromatic hydrocarbons. The apparatus an auto-sampler to which a methanol water mixture and a sample comprising nitropolycyclic aromatic hydrocarbons are sent; a silica gel/C8 separation column downstream of the auto-sampler for receiving the methanol water mixture and the sample from the auto-sampler and separating the sample containing nitropolycyclic aromatic hydrocarbons into at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene; a reduction column downstream of the separation column for receiving the at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene from the separation column and aminating the separated nitropolycyclic aromatic hydrocarbons; and a fluoresce detector. The apparatus can also include an analysis column for separating an interfering component contained in the sample from the aminated separated nitropolycyclic aromatic hydrocarbons (see, claim 2).

The Li et al. articles discloses that the determination of mono- and di-nitro polycyclic aromatic hydrocarbons (PAHs) was accomplished by on-line reduction to the corresponding amino PAHs, which were then separated and detected using high-performance liquid chromatography (HPLC) and chemiluminescence detection. On page 179 of this article, chromatograms are shown in which 2(A) is a chromatogram of a standard mixture. Peaks: 1 = 1,8- dinitropyrene, 2 = 2-nitroanthracene, 3 = 1-nitropyrene, 4 = 6-

nitrocnrysene, 5 = 3-nitroperylene and 6 = 1-nitroperylene, (B) and (C) are chromatograms of a diesel particulate extract from fractions containing mono-nitro PAHs and di-nitro PAHs, respectively, and (D) and (E) are chromatograms of a diesel exhaust emission filter extract sample from fractions containing mono-nitro PAHs and di-nitro PAHs, respectively.

While the introduction of Li et al. mentions that “great attention has been directed to 1-nitropyrene and 1, 3-, 1, 6- and 1,8-dinitropyrenes,” it does not appear that the Li et al. article discloses a separation column for separating a sample comprising nitropolycyclic aromatic hydrocarbons into at least four separate components including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene. Rather, in Li et al, the nitro PAHs are first reduced to amino PAHs using a catalyst column (see, the section 2.3 bridging pages 178 and 179 of Li et al). It is the amino PAHs that are separated by chromatographic separation (see, section 2.4 on page 179 of Li et al). Accordingly, the Li et al. article does not disclose and would not have rendered obvious the presently claimed invention including a separation column for separating a sample containing nitropolycyclic aromatic hydrocarbons into at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene.

Moreover, the separation column in Li et al. is not disclosed to be a silica gel/C8 separation column.

The present invention also includes an auto-sampler to which a methanol water mixture and the sample comprising nitropolycyclic aromatic

hydrocarbons are sent. The separation column receives the methanol water mixture and the sample from the auto-sampler. On the other hand, in Li et al., the methanol water mixture and the sample are sent first to the catalyst column. It is disclosed that “[b]ecause the methanol-water solution is not appropriate to the chemiluminescence detection system, it is necessary to change to an acetonitrile-buffer solution as mobile phase by using a switch valve.” The chromatographic separation of the amino compounds is then carried out in Li et al. using the acetonitrile-buffer solution; the chromatographic separation column does receive the sample and methanol water mixture from an auto-sampler.

Moreover, according to the present invention, the reduction column for aminating the separated nitripolycyclic aromatic hydrocarbon is downstream of the separation column. The opposite is true in Li et al. On-line reduction using a catalyst column is first carried out and then chromatographic separation is carried out downstream of the catalyst column.

For the foregoing reasons, the apparatus of the present invention is clearly not disclosed and would not have been obvious from Li et al.

In view of the foregoing amendments and remarks, entry of this amendment and favorable reconsideration and allowance of all the claims now in the application are requested.

Please charge any shortage in the fees due in connection with the filing of this paper, to the deposit account of Antonelli, Terry, Stout & Kraus,

LLP, Deposit Account No. 01-2135 (Case: 648.45478X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

/Alan E. Schiavelli/

Alan E. Schiavelli

Registration No. 32,087

AES/at  
(703) 312-6600